THURSDAY, MARCH 13, 1919.

BIOLOGICAL PROBLEMS.

Medical Contributions to the Study of Evolution. By Prof. J. G. Adami. Pp. xviii+372. (London: Duckworth and Co., 1918.) Price 18*s*. net.

A BOOK attempting to throw light upon biological problems from a new point of view is always likely to be interesting, and we therefore welcome Prof. Adami's work. Undoubtedly much controversial matter is introduced, but a point of view that sometimes challenges what is too often taken for granted is, at any rate, stimulating. Although in his letter quoted in the appendix Sir Ray Lankester protests that certain experiments are well known to him, we venture to think that many of the facts brought forward are unfamiliar to biologists in general.

The book is divided into three parts, with two appendices. Parts i. and ii. will be the most interesting to the general biologist. The reprinted papers in the latter parts of the book, however, entail a great deal of repetition, while the style is somewhat cumbrous and involved. The preparation of the book in war-time may be the excuse for leaving many things as they were originally written, later work being often referred to in footnotes, but the actual matter could, with advantage, have been condensed into a much shorter book without loss of clearness. A less unwieldy book, too, might have been published at a lower price, for we cannot say that the amount asked errs on the side of cheapness.

The first part of the book consists of the Croonian Lectures for 1917 on "Adaptation and Disease." Starting with an introductory chapter upon variation and adaptation as the basis of evolution, we get two chapters upon variation and adaptation in the bacteria, followed by one upon the corresponding adaptations in higher animals to pathogenic agencies. The next chapter deals with the inheritance of acquired conditions in the higher mammals, quoting Carrière's work with tuberculin, and Stockdale's experiments upon the effects of alcohol vapour, to show that influences acting upon the parents may affect the offspring in the two succeeding generations. Kammerer's work upon *Salamandra maculosa* is also quoted. Chap. vi. deals with the physico-chemical basis of the subject, and the author brings forward a conception of the constitution of living matter based on the structure of the proteins. He recalls the fact that in organic compounds generally the mere position of a radical profoundly alters the properties of the compound, and shows that with a complex molecule such alterations may lead to a multiplicity of different new properties. From this he proceeds to the elaboration of a physico-chemical conception of growth. The final chapter is devoted to a recapitulation and review of the conclusions reached.

It is a pity that in such a work there is evinced a spirit of animosity to certain leading biologists. We may suspect the author of setting up a figment for demolition in ascribing to Bateson the belief that evolution occurs solely by the loss of factors. We think also that nothing of importance is gained by the republication of the controversy in Appendix ii., the tone of which reflects credit upon neither party.

There are a few misprints and inaccuracies requiring attention. On p. 18 Limulus is stated to be "no crab, but an Arthropod"; this should obviously be "Arachnid." The "intestinal amœbæ" of Musgrave and Clegg referred to upon p. 46 are almost certainly coprozoic forms and not true parasites; nevertheless, the adaptability to unusual forms of diet is interesting. The allusion upon p. 240 to Loeb's work on chemical fertilisation is out of date and should not have been left as it stands. In the first place, it has been shown conclusively that development is not initiated by mere changes in tonicity. Moreover, though active nuclear changes and cell division may be set up by artificial means, they do not always continue, but under certain conditions the process may cease when the four- or eight-celled stage has been reached, leaving the resting cells susceptible each of fertilisation by a spermatozoon.

The main value of the book consists in the insistence upon the physico-chemical constitution of living matter, and we welcome particularly the author's onslaught upon Weismann's cut-and-dried morphological conceptions of heredity. Nevertheless, it should be borne in mind that the work of Conklin and others shows the existence of structure even in the egg. It may be pointed out, however, that in chap. vii. we are somewhat inconsistently presented with some purely morphological diagrams illustrative of the side-chain theory. It is evident that a physico-chemical explanation of such a theory must depend upon unsatisfied or unsaturated linkages, which would be just as easy to represent and would convey a truer picture of the mechanism of protoplasmic reaction.

On the whole, the book may be commended to the attention of the general biologist.

GENETICS FOR THE BOTANIST.

Plant Genetics. By J. M. Coulter and M. C. Coulter. Pp. ix+214. (Chicago: University of Chicago Press; London: Cambridge University Press, 1918.) Price 1.50 dollars net.

THIS little book is one written by botanists for botanists. The authors state in their preface that it is designed especially for the undergraduate student in botany who wishes to obtain some knowledge of what is being done in genetics without desiring to specialise in the subject. They have attempted, so far as possible, to present an exposition of Mendelian, or neo-Mendelian, phenomena illustrated by examples from the vegetable world alone. As to the advisability of this there is likely to be some difference of opinion, for many hold, and with some justice, that one of the instructive features of genetics for the

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student lies in the numerous close parallels to be found between animals and plants in respect of heredity. A discovery in an animal may at any moment throw a flood of light upon puzzling phenomena in plants, and the converse is equally true. The genetics of plants and animals are so closely interwoven that an attempt to treat of one without the other necessarily leads to a sense of incompleteness. At the same time the unity of some of the fundamental phenomena of life in the vegetable and animal kingdoms—a most valuable lesson for the young student—is apt to be lost sight of. Even the authors have had to confess that the animal cannot be entirely excluded, for they had perforce to bring in Morgan's Drosophila and Castle's rats. Nevertheless, they have succeeded in illustrating most of the important phenomena from plants alone, and the work will be of service not only to the young botanist, but perhaps even more so to the zoologist, who is apt to be hazy with regard to the special features that plants exhibit.

We venture to hope that in the next edition the authors will enter rather more fully into the phenomena of the fertilisation of plants; for it is here that the zoologist so often encounters a stumbling-block. The chapter on endosperm inheritance is a distinct advance upon the usual text-book treatment; but we would suggest, for the sake of the zoologist, a more detailed account of the manner in which the egg is derived from the megaspore, and of the fate of the nuclei of the pollen-grain. Apogamy, too, might be treated more liberally, with reference made to the important researches of Ostenfeld and Rosenberg. Apart from its intrinsic value, the work of these observers has a peculiar interest in connection with Mendel's own work on Hieracium. On the whole, the authors have given a clear and lucid presentation of genetic phenomena in plants, and one that should prove useful to the class of student for whom it was designed. We hope it may fall into the hands of many students and teachers in this country, where the study of plant genetics is far less widespread than it should be. It is high time it became an integral part of the botanical course at every university, and the authors of this little book have certainly demonstrated that this can easily be done without unduly trespassing upon the field of the zoologist.

For the benefit of the English student, it should be stated that although the authors have naturally drawn upon American material in illustration of the various phenomena, it does not follow that these were necessarily discovered on the other side of the Atlantic. They state, for instance, that "the classic illustration of coupled characters was brought to light by Emerson during breeding experiments with corn." If there is a classic example here, it should surely be Bateson and Punnett's sweet peas, where the phenomena were first discovered, and the peculiarities of this type of inheritance first worked out. The authors confess to some inexactness in dealing with details, urging the excuse of pedagogical necessity. Still there are few statements definitely misleading. But the account of Mendel's peas on p. 37 looks as though the authors had fallen into the familiar trap that has snared so many an elementary student, forgetting that the seed characters used belong to a generation subsequent to that of the plant on which they are borne.

The book is of a handy, small size for a student's pocket, well printed, and illustrated by a number of simple diagrams.

NATURAL HISTORY IN THE NEW WORLD.

(1) *Far Away and Long Ago. A History of My Early Life.* By W. H. Hudson. Pp. xii+332. (London: J. M. Dent and Sons, Ltd., 1918.) Price 15*s.* net.

(2) *Jungle Peace.* By William Beebe. Pp. 297. (New York: Henry Holt and Co., 1918.)

(3) *The Ledge on Bald Face.* By Major C. G. D. Roberts. Pp. 255. (London: Ward, Lock, and Co., Ltd., 1918.) Price 5*s.* net.

(1) THERE is much of the old-time naturalist in "Far Away and Long Ago," by that G.O.M. of natural history, Mr. W. H. Hudson. It is a simple story, the recollections of his early life on the savannahs of the Argentine. We can imagine the *estancia*, with its poplars and willows, and with its flowery orchard lying isolated on the lonely downs. The whole was protected by a broad moat, and must have been a veritable oasis to woodland birds in what otherwise was to them an inhospitable land. Here Hudson made friends of birds, beasts, and trees, each one to him acquiring its own individuality: the cowbird parasitical like the cuckoo; the red willow, with its pair of tyrant birds, ever ready to attack the wandering hawk; green paroquets; peaches in blossom, loveliest of sights, and a proper bandstand for flocks of singers. The armadillo and the opossum were burrowers, the latter, with its children, giving hospitality to pit vipers, most malignant of snakes. Here and there, on the plains, were *viscacha* villages, immense badger-like earths of a large rodent now getting extinct. The house was an old one, a relic of the early Spanish settlers, tillers of the ground, later driven to the herdsman or *guacho* life. As to the fenman the fens are the most beautiful of all lands, so to Hudson his pampas colours of yellow to rust, the latter produced by giant thistles, are beyond compare, their serenity disturbed only by the occasional *pampero* (hurricane) from the Southern Ocean. He was clearly a lonely boy, and it is not difficult to see how he made friends with Nature.

Hudson brings us back to Rosas, whom he describes as the bloodiest, the most original-minded, and the greatest of the dictators of South America. Rosas was in origin a *guacho*, and he had the cruelty and sardonic humour of the class from which he sprang. He brought peace to the prairies, and in his time came many of

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